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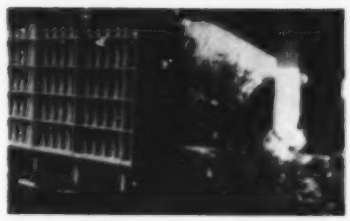
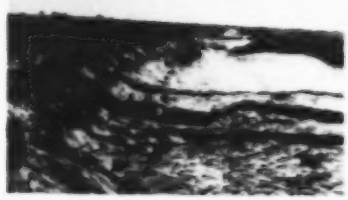
Earthquake of October 15, 1979, Imperial Valley, California.

1
Imperial County Services Building before (left) and after earthquake (right) showing support pillar failure at the east end of building. This 6-story reinforced concrete frame and shear wall structure completed in 1971 at a construction cost of $1.87 million, was designed to be earthquake resistant. However, during the quake the concrete at the base of the support columns was shattered and the vertical reinforced bars were severely bent allowing the east portion of the building to sag about 30 cm. Replacement costs were estimated at $7 million. Photograph Credits: Bay Area Regional Earthquake Preparedness Project (BAREPP) and U.S. Geological Survey .



2
Earth cracks near El Centro. Such cracks caused the breakage of underground water pipes in many places; however utilities were interrupted for only a short period of time. Photograph Credit: Univ. of Colorado.



3
A sand boil near El Centro provides graphic evidence of liquefaction. Such boils were found especially along the southern extent of the Imperial Fault. Liquefaction occurs when earthquake ground shaking distorts the granular structure of the ground causing some loosely packed groups of grains to collapse together. Each collapse transfers pressure from the grain groups to the water. When the pore-water pressures reach a critical level, the granular material suddenly behaves as a liquid rather than a solid and liquefaction has taken place. Photograph Credit: U.S. Geological Survey (G. Reagor).

4
Merchandise that fell from shelves in Brawley Drug Store. Aftershocks continued for several months, and several shocks were strong enough to knock merchandise from shelves and to break display windows in the area. Photograph Credit: U.S. Geological Survey (G. Reagor).

5
Fallen porch on 200 block of "G" Street in Brawley. Several homes were damaged in this block. Most of the residential damage was to chimneys. Photograph Credit: U.S. Geological Survey (G. Reagor).

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6
A fault trace crosses a cultivated field near El Centro. The surface rupture on the Imperial Fault extended from about 2.5 miles (4 km) north of the International Border to about 2.5 miles south of Brawley. Maximum lateral displacement was about 22 inches (55 cm) in Heer Dunes and the maximum vertical displacement was 7.5 inches (19 cm) southeast of Brawley. Photograph Credit: Univ. of Colorado.

7
The unreinforced brick wall at the Brawley Theater collapsed. Most of the building damage in the business district of Brawley occurred between the 500 and 900 blocks. Unreinforced brick structures are particularly vulnerable to earth shaking. Photograph Credit: Bay Area Regional Earthquake Preparedness Project (BAREPP).

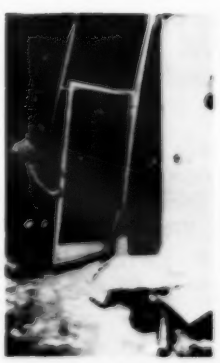
Earthquake of April 26, 1981, Westmorland, California.

8
View of partially collapsed adobe building in Westmorland. Seventy percent of the 900 homes in Westmoreland were damaged. Most, like this structure, were constructed of adobe and/or brick. Photograph Credit: Bay Area Regional Earthquake Preparedness Project (BAREPP).

9
View of a two story building partially collapsed in earthquake. Note the undamaged one story building on the left. Twelve buildings were severely damaged and an additional 30 sustained minor damage. City officials ordered the demolition of ten downtown buildings that were damaged beyond repair. Photograph Credit: Bay Area Regional Earthquake Preparedness Project (BAREPP).

Earthquake of July 8, 1986, Palm Springs, California.

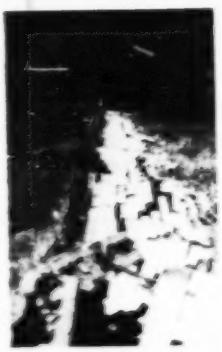
10
This porch was separated from the trailer and damaged by quake. Trailers incurred more structural damage than any other type of structure in this earthquake. Photograph Credit: Bay Area Regional Earthquake Preparedness Project (BAREPP).



11
This rockfall on the highway is just one of many landslides that occurred in the Palm Springs, California, area. Such rockfalls can temporarily block roads and highways and hinder the movement of emergency vehicles. Photograph Credit: Bay Area Regional Earthquake Preparedness Project (BAREPP).

12
Typical damage is this broken display window in a store in downtown Palm Springs. Display windows often break in moderate magnitude earthquakes since the window occupies a large structurally unsupported area of the building subject to torsional forces. Photograph Credit: Bay Area Regional Earthquake Preparedness Project (BAREPP).

13
This concrete block fence near a trailer park collapsed during the quake. Such fence failures were common. Note bent reinforcing rod. Photograph Credit: Bay Area Regional Earthquake Preparedness Project (BAREPP).



Earthquake of October 1, 1987, Whittier Narrows, California.

14
Left San Gabriel Civic Auditorium after main shock and before large aftershock. Note cracks near bell tower. On the right is the same structure showing damage that occurred during large after-shock. The bell tower that was weakened by the main shock has fallen, and the exterior of building is damaged. Photograph Credit: U.S. Geological Survey, (G. Reagor).

15
Partial collapse of the back wall of thrift store located on Main Street between Fifth and Sixth Streets in Alhambra. Falling bricks crushed cars parked in the street. Photograph Credit: U.S. Geological Survey, (G. Reagor).

16
The Garvey West Apartment building in Monterey Park at Monterey Pass Road in Garvey shifted about 10 inches to the east on its foundation. Shown here is the southeast corner of the building. Photograph Credit: U.S. Geological Survey, (G. Reagor).

17
Partial collapse of the May Company's three-level parking garage at Quad Shopping Mall in Whittier. The structure, built in 1965, is located at the corner of Whittier Blvd. and Painter Ave. Photograph Credit: U.S. Geological Survey, (G. Reagor).

18
Exterior view (left) of badly damaged brick residence in the 5000 block of Bright Street in North Whittier. Interior view on right shows cracks extending through the outside wall of structure. Photograph Credit: U.S. Geological Survey, (G. Reagor).

19
Collapse of chimney through roof of above residence (see slide 18 above) and onto bed of four-year old boy who was rescued and hospitalized with broken collar bone. Photograph Credit: U.S. Geological Survey, (G. Reagor).

20
Collapse of wall of second story of Art's Jewelry and Loan establishment on Greenleaf Avenue in "Uptown" Whittier. This older section in north Whittier sustained serious damage. At least 200 residences and 30 businesses were badly damaged and most of the severe damage was to structures built before 1930. Photograph Credit: U.S. Geological Survey, (G. Reagor).

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